

PROGRESS REPORT

YEAR THREE OF OPERATIONS

Garry Ullstrom, CEO



KUTERRA



KUTERRA



Land Raised™ Atlantic Salmon farm



Transition



Fisheries and Oceans
Canada

Pêches et Océans
Canada

TIDEScanada
uncommon solutions for the common good

THE
CONSERVATION FUND



SUSTAINABLE DEVELOPMENT
TECHNOLOGY CANADA™

Funder-driven industry development

Profit-driven business development



Our mission

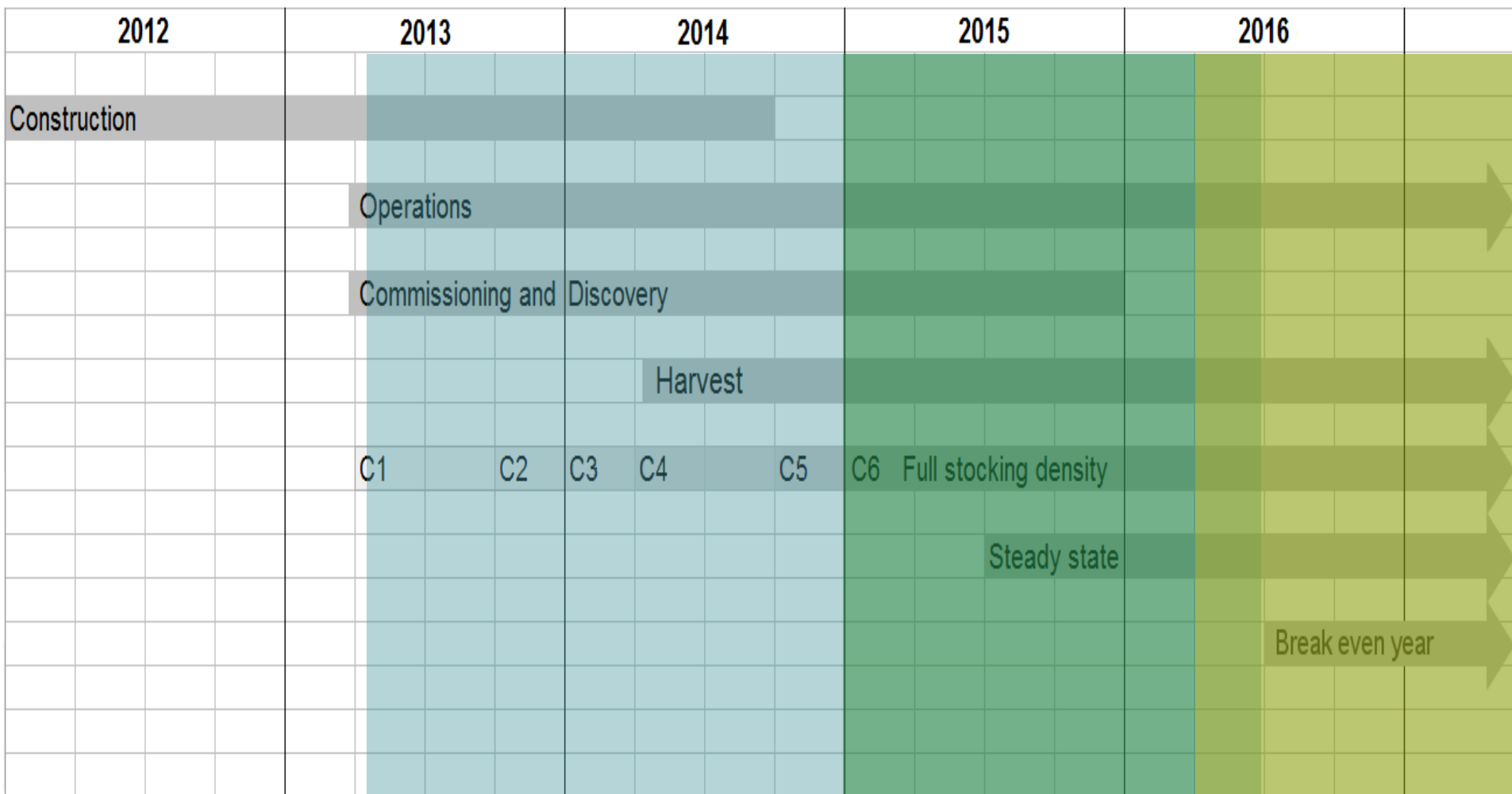


Assess
technical, biological, economic
feasibility

of raising Atlantic salmon to harvest size using land-based RAS.



Stages and milestones



Technology

Biology

Economics

Technology - Biofilter



Technology - Flavour management



Technology – Since startup



The technology works.
It's harder than it looks.



Biology – Fish performance

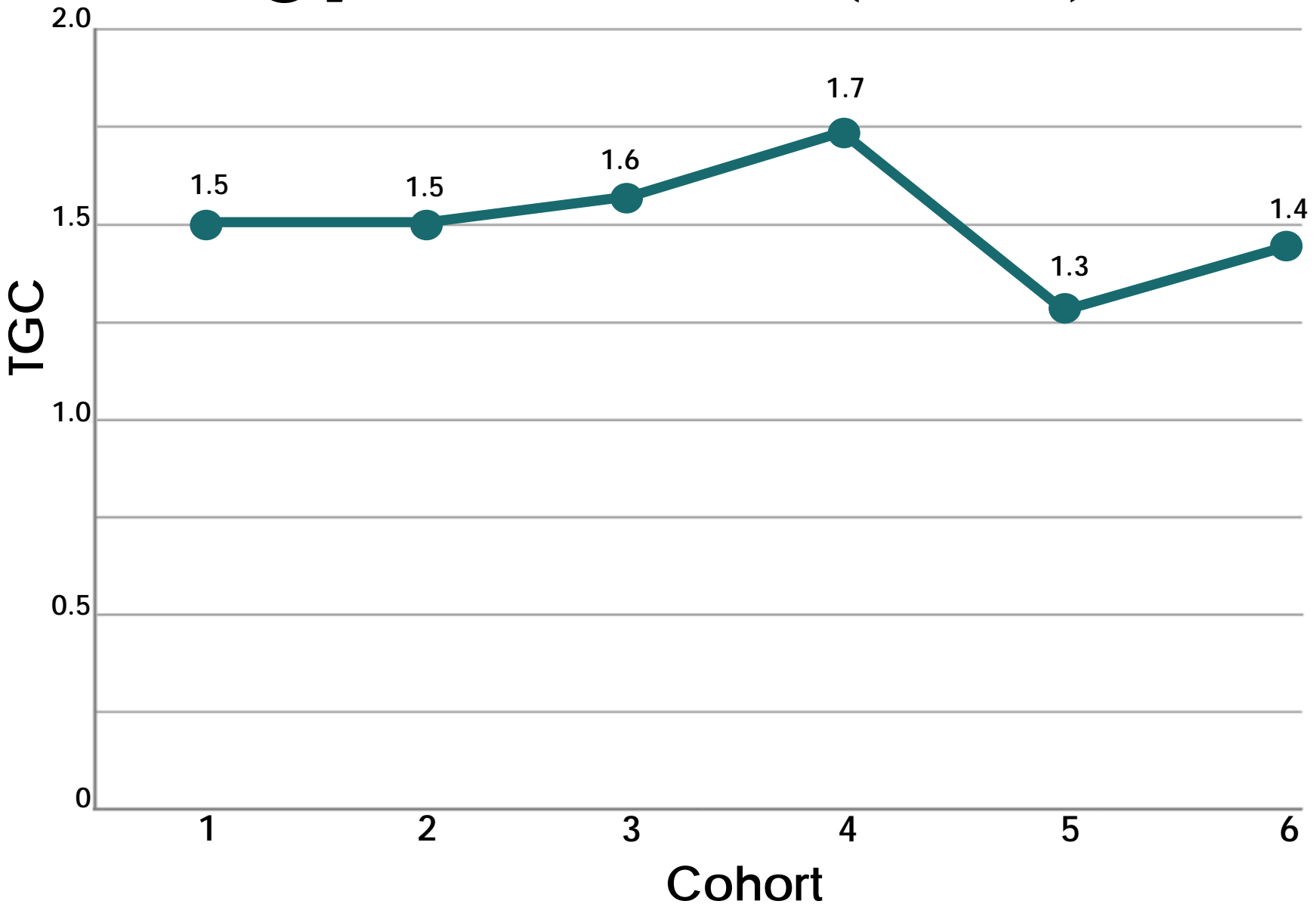


Key metrics:

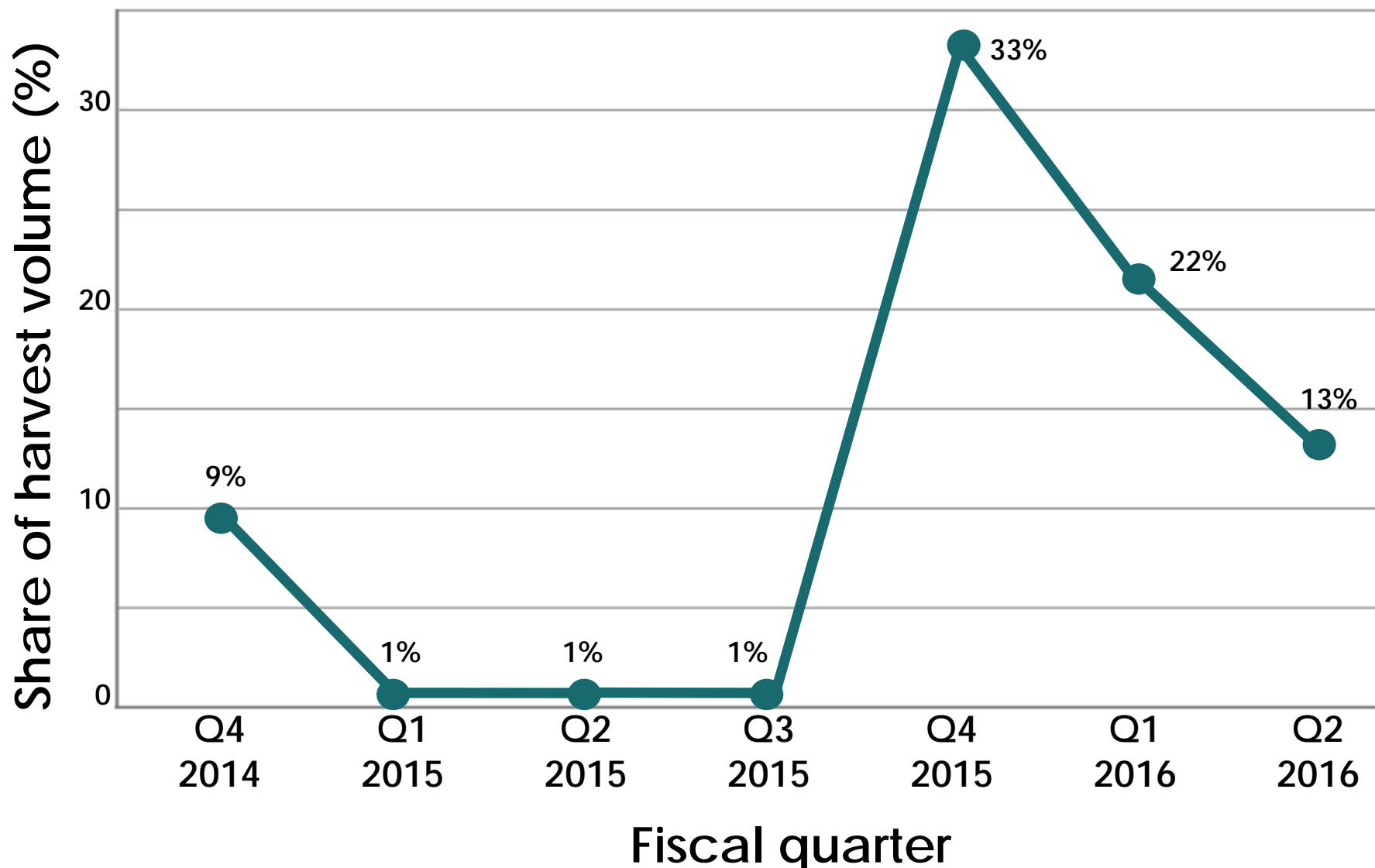
1. Growth (TGC)
2. Feed conversion
3. Mortality
4. Density
5. Early maturation



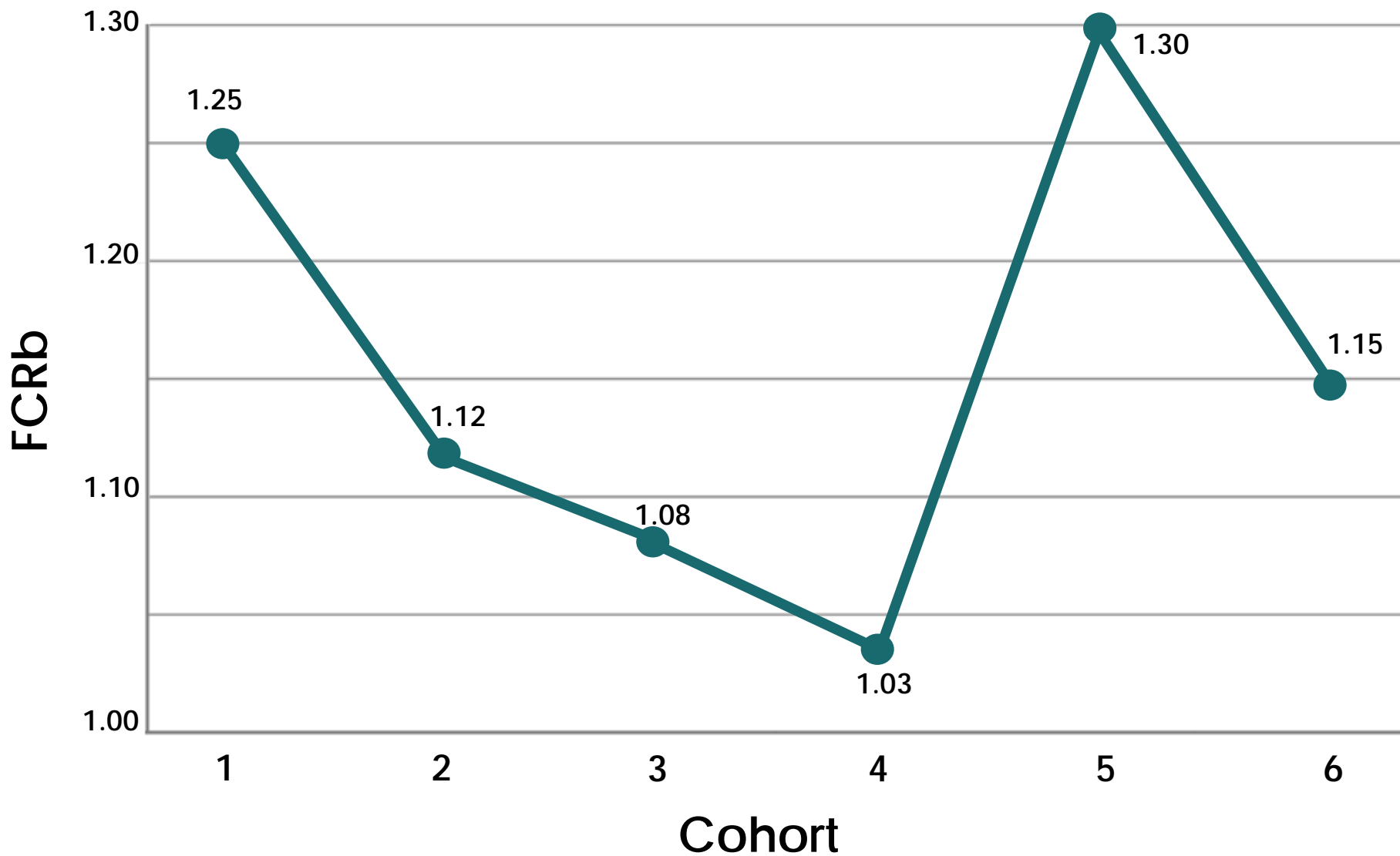
Biology – Growth (TGC)



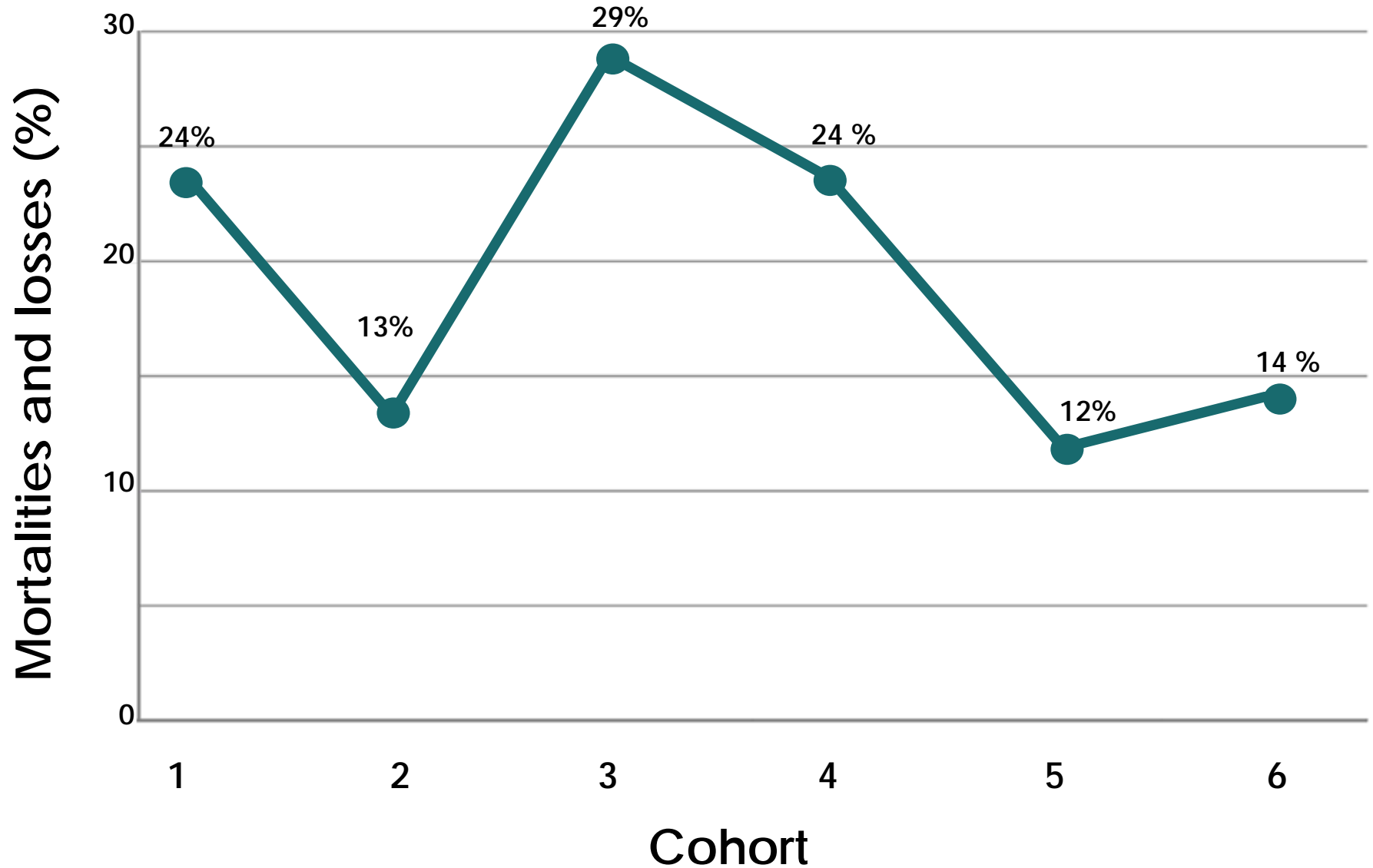
Biology - Size downgrades



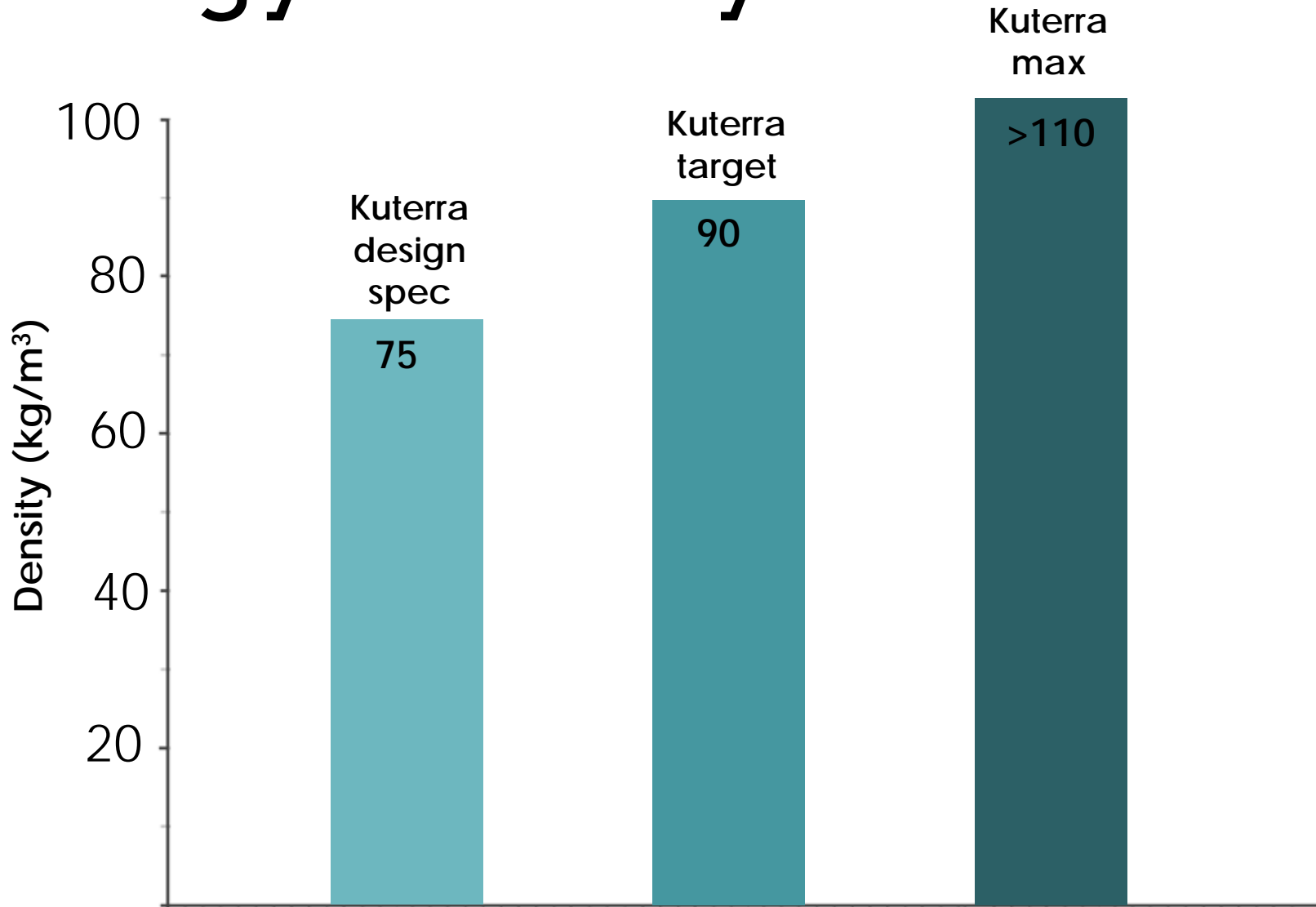
Biology - Feed conversion



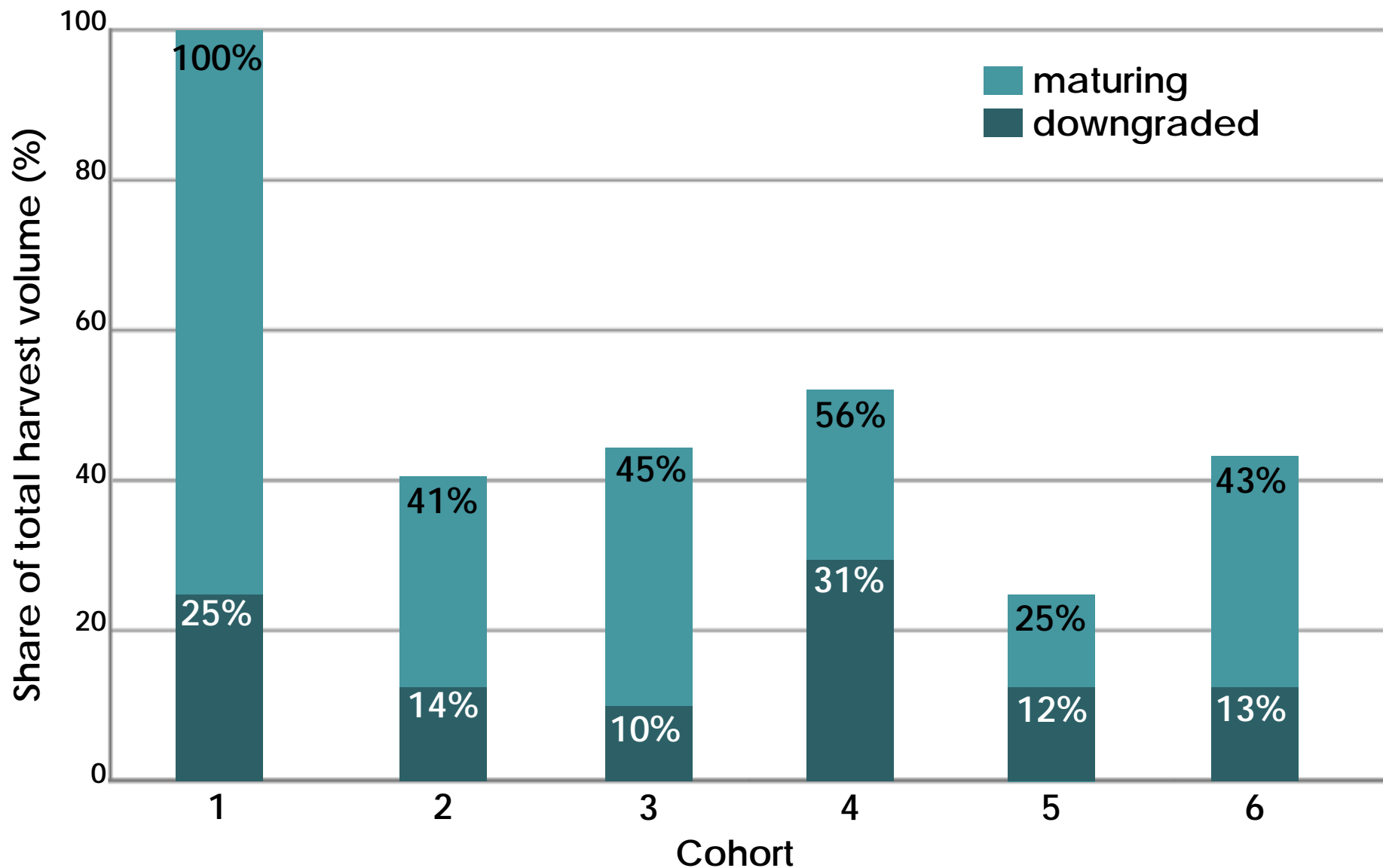
Biology - Mortality



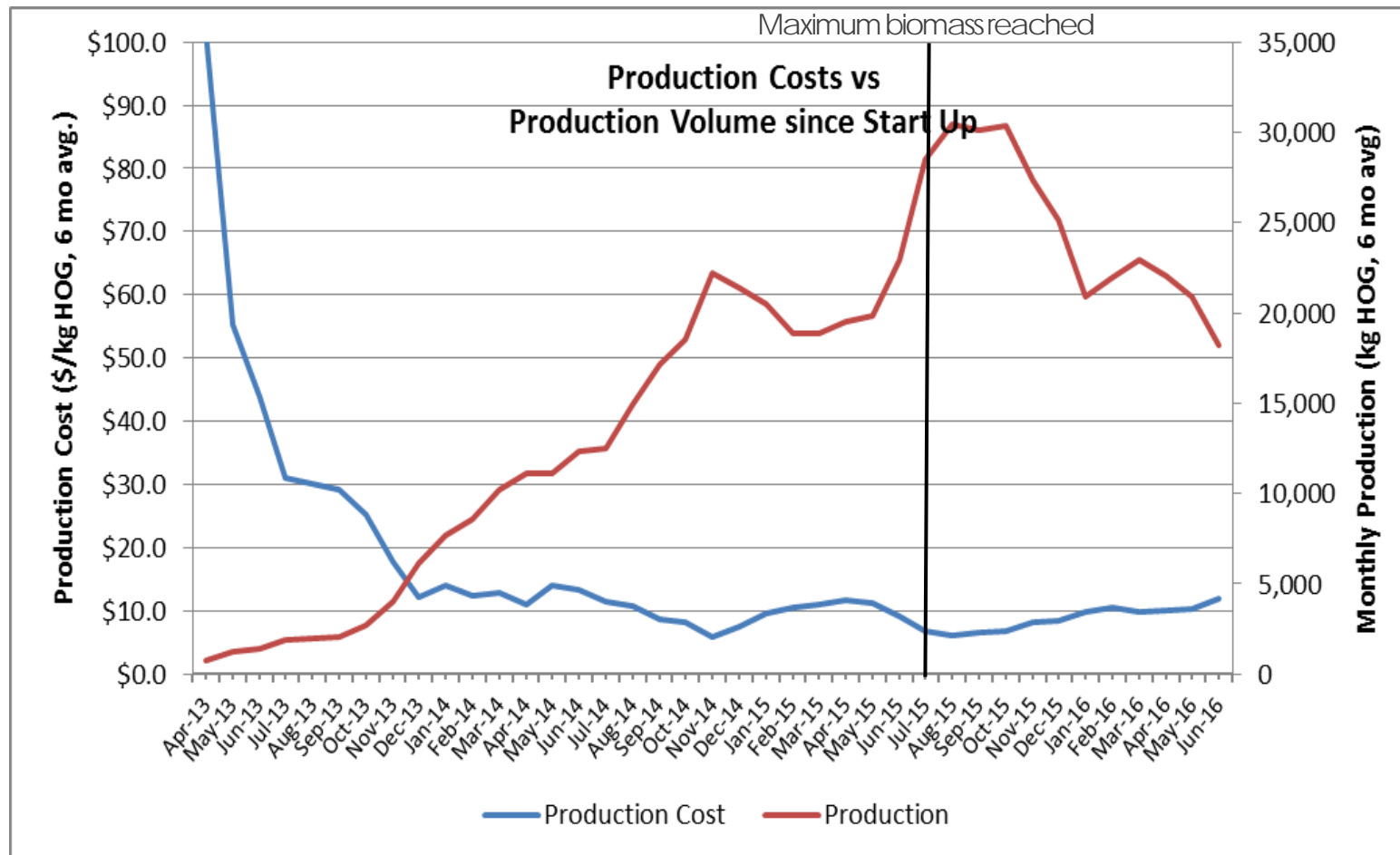
Biology - Density



Biology - Early maturation



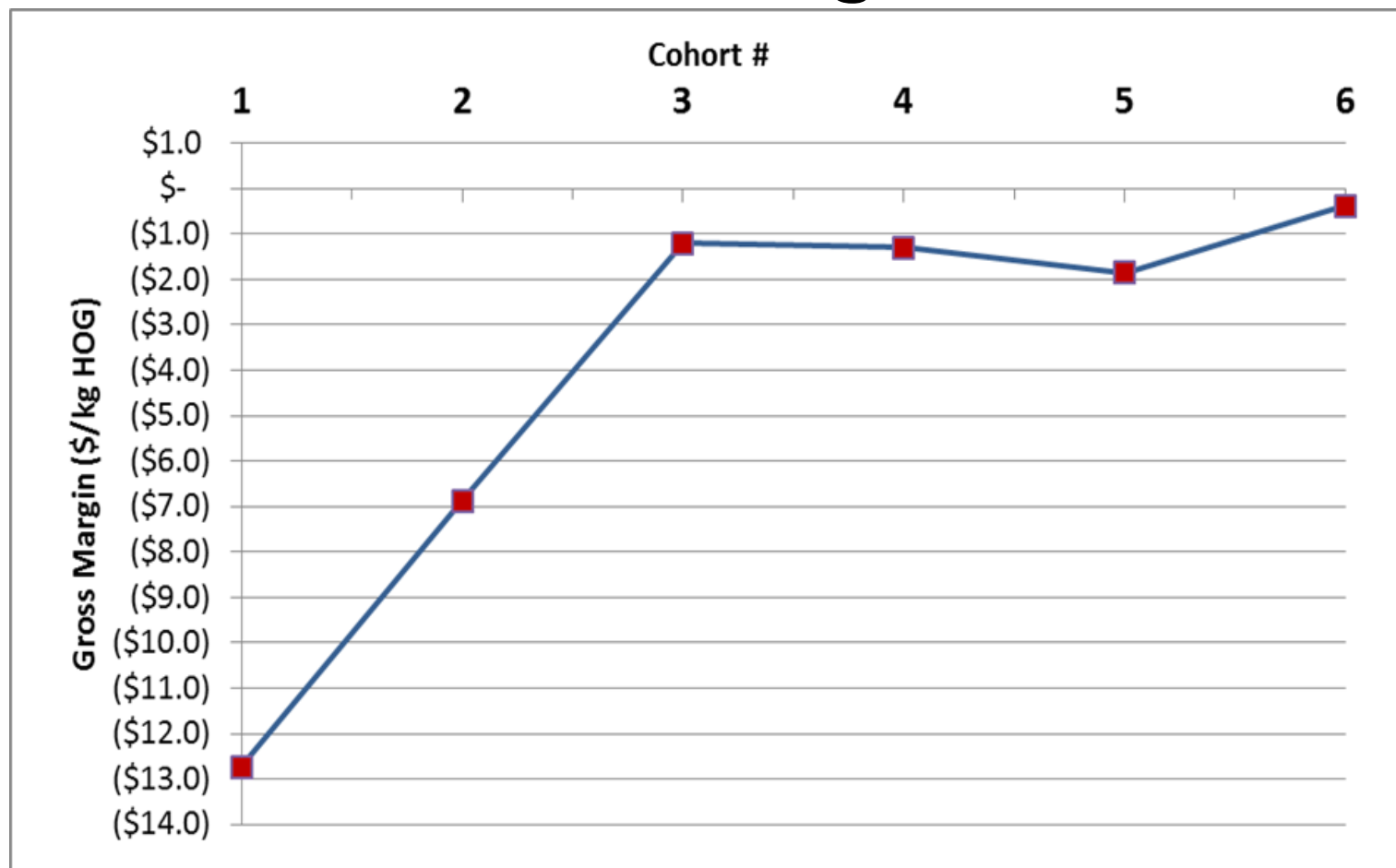
Economic results



Economic results



Gross Margin



The core question



Is Kuterra profitable yet?

No, because:

- Slower than expected growth
- Irregular timing of smolt intakes
- High early maturation
- High R&D and reporting costs

Next steps for Kuterra



1. Solve the early maturation challenge
2. Improve fish growth
3. Address the irregular smolt timing
4. Address the scale issue

Industry development



- Final milestone report
- Capital cost retrospective report
- Cohort 4 report
- Cohort 5 & 6 report
- IEMP final report from Pacific Salmon Foundation

Visit: tidescanada.org & kuterra.com



Industry development



Can raising Atlantic salmon using RAS ever be profitable?

To answer that question we used what we learned from Kuterra to create a sophisticated financial model of a 3000MT RAS Atlantic salmon farm.

Financial model elements



1. Actual operating costs
2. Conservative growth rates
3. Actual product quality
4. Proven pricing
5. Proven flavour management strategies
6. Regular smolt intakes
7. Access to salt-water
8. Economies of scale

Financial Model – 3000MT



Remaining uncertainties

1. Capital Cost: Design to be finalized and and costed out.
2. Early maturation <10% to be confirmed.

	Optimistic	Base	Pessimistic
\$/kg HOG CAPEX	13	16	21
IRR	19%	14%	9%

Opportunities for Improved Results Technology



Reduce CAPEX
per kg of annual
production

Reduce operating
costs

Improve technology
to improve water
quality to improve
fish performance



Opportunities for Improved Results

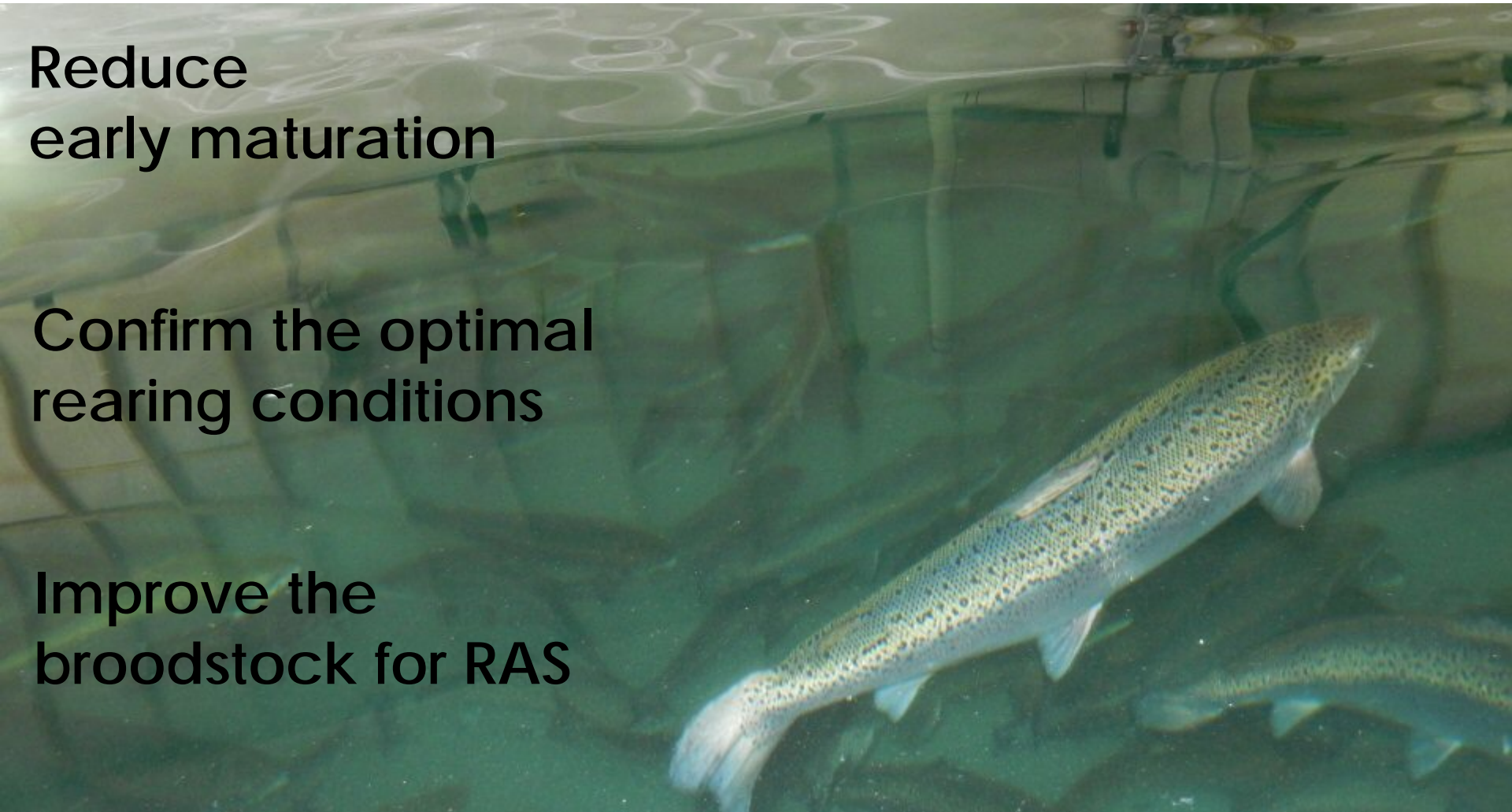
Biology



Reduce
early maturation

Confirm the optimal
rearing conditions

Improve the
broodstock for RAS



Summary



1. We've proven and assessed the technological and biological feasibility of growing Atlantic salmon in RAS.
2. We've identified the key opportunities for improvement and optimization.
3. We've provided concrete technical, biological and economic data in order to reduce the risks for others and to speed innovation and the development of the industry.
4. We've identified the elements needed for economic success.



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[http://tidescanada.org/programs/
salmon-aquaculture-innovation-fund/](http://tidescanada.org/programs/salmon-aquaculture-innovation-fund/)

